

**Archaeometallurgy: Production and Use**

Code: 44483  
ECTS Credits: 6

Degree	Type	Year	Semester
4317545 Prehistoric Archaeology	OT	0	2

## Contact

Name: Rafael Mico Perez

Email: rafael.mico@uab.cat

## Use of Languages

Principal working language: spanish (spa)

## Other comments on languages

Nivel que permita la lectura de publicaciones arqueológicas

## Teachers

Roberto Risch

Eni Soriano Llopis

## Prerequisites

There is no prerequisite, although a basic knowledge of prehistoric metallurgy is recommended.

## Objectives and Contextualisation

Archeometallurgy focuses on the study of metallurgy in all its phases (mining, smelting, melting, finishing, use, maintenance), both from a technological, economic and social point of view. The archaeological materials that can be studied are not limited to finished products in different types of metals (copper-based, gold, silver, lead, iron), but to all the tools and instruments used (lithic, bone, ceramic), intermediate products as well like scraps and residues. The objective of this course is to acquire knowledge that allows us to understand any archeometallurgical study and to propose one of our own autonomously. For this, aspects such as the planning of objectives, the main analysis techniques actually in use (destructive and non-destructive) and the interpretation of results will be addressed. The data will be presented both theoretically and, mainly, from practical cases and current archaeological debates. The course's approach is theoretical-practical and includes practices with archaeological and mineralogical materials.

The classes given by the UAB teaching team will be combined with seminars given by researchers of recognized prestige in the field of archeometallurgy.

## Competences

- Analyse and extract significant scientific information from archaeological materials and from the results of specialist scientific studies.
- Combine findings from different programmes of specialist analysis, identifying any contradictions and drawing conclusions

- Critically analyse a scientific problem area on the basis of specific evidence and documents.
- Design research projects on prehistoric archaeological sites and materials
- Knowledge and understanding that provide a basis or opportunity for originality in developing and / or applying ideas, often in a research context.
- Recognise and use suitable theoretical and methodological concepts for the design, planning and execution of projects on prehistoric archaeological sites and materials.
- Recognise present-day challenges in the study of prehistoric archaeology.
- Show rigour, responsibility and quality in research and dissemination work.
- That students have the learning skills that enable them to continue studying in a way that will be largely self-directed or autonomous.
- That the students can apply their knowledge and their ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study.
- Work both individually and in multidisciplinary teams

## Learning Outcomes

1. Critically apply techniques for research into metallic materials in prehistoric archaeology.
2. Critically assess the value of the different tools needed for research in archaeobotany.
3. Knowledge and understanding that provide a basis or opportunity for originality in developing and / or applying ideas, often in a research context.
4. Link field work and the study of prehistoric lithic resources to the specific problems of historical knowledge to be solved.
5. Recognise and put into practice basic teamwork skills.
6. Recognise the main challenges in the study of prehistoric metallic resources.
7. Relate theoretical approaches to their historical context and to research methods.
8. That students have the learning skills that enable them to continue studying in a way that will be largely self-directed or autonomous.
9. That the students can apply their knowledge and their ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study.
10. Use the specific technical vocabulary for interpretation in the field of zooarchaeology.
11. Use the specific technical vocabulary for interpretation.

## Content

1. Prehistoric metallurgical production: General aspects, phases and tools used
2. Planning, objectives and archaeometallurgical sampling
3. Analytical techniques I. Elemental composition and metallographic microstructure
4. Analytical techniques II. Lead Isotope Analysis and Metal Traceology
5. Case study I. Study of slags and copper supply areas in the chalcolithic metallurgy of the southeast of the Iberian Peninsula
6. Case study II. Archaeometallurgy of the Nebra Disk (Germany)
7. Goldsmithing and metallurgy of noble metals
8. Iron work and iron and steel industry

## Methodology

Directed activities:

- Theoretical classes on theoretical and methodological aspects of the course

- Discussion and debate classes
- Seminars with renowned researchers
- Practical workshop with archaeological materials

Supervised activities:

- Tutorials and guided learning exercises

Autonomous activities:

- Research, reading papers, writing courseworks, studying

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

## Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Discussion and debate classes	3	0.12	1, 11, 6
Practical workshop with archaeological materials	3	0.12	1, 11, 9, 3
Seminars with renowned researchers	15	0.6	1, 11, 6, 5, 3
Theoretical classes on theoretical and methodological aspects of the course	15	0.6	1, 11, 6, 5, 3
Type: Supervised			
Tutorials and guided learning exercises	25	1	1, 11, 9, 8
Type: Autonomous			
Research, reading papers, writing courseworks, studying	89	3.56	1, 11, 9, 8, 6

## Assessment

- Practical tests. Made with archaeological materials and metallic minerals
- Submission of courseworks and case studies. Short exercises on specific aspects of the course contents
- Research dissertation. Final work focused on a specific aspect (methodological or practical) of the course contents.

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Practical tests	45%	0	0	1, 11, 9, 6
Research dissertation	40%	0	0	1, 11, 9, 8, 6, 5, 3
Submission of courseworks and case studies	15%	0	0	1, 2, 11, 10, 9, 6, 5, 4, 7

## Bibliography

### General works

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Dias, M.I. y Cardoso, J.L. (eds.) 2012: *Actas do IX Congresso Ibérico de Arqueometría, Vol. 19. Lisboa (2011)*. Estudos Arqueológicos de Oeiras.

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Tylecote, R. F. 1986. *The prehistory of metallurgy in the British Isles*: London, The Institute of Metals.

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### Topic 1 and 2. Prehistoric metallurgical production / Planning, objectives and archaeometallurgical sampling

Craddock, P.T. 1995. *Early metal mining and production*. Edinburgh: Edinburgh University Press.

Delibes de Castro, G., Montero Ruiz, I. (coord.) 1999. *Las primeras etapas metalúrgicas en la Península Ibérica II. Estudios regionales*. Madrid: Instituto Universitario Ortega y Gasset.

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#### Topic 4. Lead Isotope Analysis and Metal Traceology

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## **Software**

No specific software is necessary.